

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of )

Allocation Of Spectrum In The 5 GHz Band )  
To Establish A Wireless Component Of The )  
National Information Infrastructure )

RM-8653  
RM-8648

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**REPLY COMMENTS**

Constellation Communications, Inc. ("Constellation"), by its attorney, files these Reply Comments in response to the comments filed on the petitions for rulemaking of Apple Computer, Inc. ("Apple") and Wireless Information Networks Forum ("WINForum") proposing the allocation of the 5 GHz band for unlicensed wireless data transmission.

Constellation's concern with these petitions is the potential for harmful interference caused by unlicensed transmitters into the 5 GHz satellite receivers providing the Earth-to-space feederlinks for its low earth orbit ("LEO") mobile-satellite service ("MSS") system. As explained in the July 10, 1995 Comments of Constellation, as well as those of Loral/Qualcomm Limited Partnership L.P. ("LQP"), the limited sharing analysis provided by the petitioners is not complete and is likely to underestimate the actual interference that could be caused by the unlicensed operations proposed in these petitions.

In order to ensure compatibility with LEO MSS feederlink operations, the petitioners must show that the aggregate power radiated by all of the unlicensed data transmitters within the LEO MSS satellite receiving beam does not significantly degrade the performance of the LEO MSS feederlinks. This type of interference case was recently addressed during the Commission's 28 GHz Local Multipoint Distribution Service ("LMDS") proceeding where the aggregate EIRP density produced by the ensemble of transmitters was considered to be a possible sharing criteria

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to protect LEO MSS feederlinks. Although none of the LMDS transmitting facilities would be individually licensed, the existence of a blanket licensee could assure sufficient control to enforce the aggregate EIRP density limit. However, this is not the case with the proposed unlicensed operations for which no provision is being made for the enforcement of the aggregate EIRP density limit needed to protect the LEO MSS feeder link satellite receivers. None of the parties have yet to make a specific proposal on how to protect LEO MSS feeder link receivers at 5 GHz.<sup>1</sup>

Constellation is aware that a significant number of persons, companies and organizations have filed comments in support of these petitions. However, virtually all of the comments are directed at a vague, undefined concept that has yet been reduced to specific rule provisions on which meaningful comment can be provided. In particular, no new technical information is presented in the initial round of comments to assist in evaluating the feasibility of sharing the 5 GHz bands with unlicensed operations.<sup>2</sup>

A major area of technical uncertainty is whether the unlicensed operations are to function as indoor wireless local area networks, outdoor mobile links, outdoor wide area networks, or point-to-point links to replace local telephone lines. Several parties express concerns with any point-to-point aspect of the petitions, and question whether point-to-point types of paths would

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<sup>1</sup> If unlicensed operations are ultimately approved in the 5 GHz feederlink bands, Constellation assumes that the Commission will make clear that no interference protection to unlicensed wireless operations will be afforded from feederlink transmissions operated on a licensed basis. Constellation would also object to any proposal that would limit its flexibility to locate its feederlink Earth stations based on a requirement to afford protection to unlicensed operations in any geographical area.

<sup>2</sup> Constellation sees no merit in the counter-proposal of Pulson Communications to clear the 2.5-8.5 GHz band for its ultra-wideband radio technology because its underlying premises that this band is inefficiently used and in some cases unused is simply incorrect.

not be better provided in other bands.<sup>3</sup> Constellation shares these concerns because outdoor operations require the use of higher transmitted power levels, and thus have a potential for interference into feederlink reception at Constellation's satellite receivers.<sup>4</sup>

It should be apparent that the parties have not yet addressed all of the outstanding spectrum sharing issues. In addition to the concerns raised by Constellation and LQP with respect to interference into their LEO MSS feederlinks, the Federal Aviation Administration has expressed concerns that have not yet been addressed by the petitioners. Also, the petitioners have not adequately addressed the impact of unlicensed operations on amateur operations in the 5650-5850 MHz and 5850-5925 MHz bands<sup>5</sup> or on the operation of unlicensed Part 15 equipment in the band.<sup>6</sup> Nor have the petitioners adequately examined the impact of existing operations on the proposed unlicensed operations.<sup>7</sup> Even Apple admits the need for additional information on sharing with other services.<sup>8</sup>

The petitioners and their supporters have failed to provide the technical detail needed to adequately describe the proposed operations, to evaluate the amount of spectrum required, to

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<sup>3</sup> See e.g., Comments of Alcatel Network Systems, the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association and Harris Corporation-Farinon Division.

<sup>4</sup> The petitioners do not address how they will resolve the potential interference problems that are likely to arise if low power, short distance devices and higher power, longer path length devices operate in the same band.

<sup>5</sup> See e.g., Comments of America Radio Relay League, William J. Kaiser (N6OLD), Northern Amateur Relay Council of California, David M. Shaw (WB6WTM), Samuel F. Wood (WB6BUP) and Southern California Repeater and Remote Base Association.

<sup>6</sup> See Comments of Andrew Corporation at 5-7.

<sup>7</sup> For example, the Northern Amateur Relay Council of California notes that their operations regularly experience interference from shipborne radars in the 5.8 GHz band, and such interference is likely to disrupt unlicensed wireless data operations in the band as well.

<sup>8</sup> See Apple Comments at 24.

establish the necessary sharing criteria to protect other services in the band, or to define specific rule modifications to implement the proposed operations. As a result, it is premature for the Commission to issue a Notice of Proposed Rulemaking. If the Commission believes it desirable to pursue the proposals in these petitions, it should first issue a Notice of Inquiry to collect the additional technical information necessary to develop a meaningful set of specific rule provisions for parties to analyze and comment on in a rulemaking proceeding, including proposals for specific sharing criteria.

In particular, Constellation requests the Commission to collect the following information in any such Notice of Inquiry:<sup>9</sup>

- (a) What are the technical characteristics of each type of proposed operation (indoor LAN, outdoor WAN, point-to-point, etc.) in terms of radio frequency parameters such as power, antenna gain, data rate, modulation, bandwidth, path length, etc.?
- (b) What is the user demand for such wireless transmitters and what is the minimum amount of spectrum needed to satisfy this demand?
- (c) What are the specific technical limitations of the current Part 15 provisions that prevent these requirements from being satisfied?
- (d) If unlicensed transmitters are to be used outdoors, what is the distribution of outdoor to indoor users, and what is the distribution of anticipated path lengths of the outdoor users? Why can't other bands or licensed services be used for outdoor paths, particularly for paths longer than a few hundred meters?
- (e) What is the maximum limit on the aggregate EIRP density that would be emitted by the proposed unlicensed wireless transmitters within a specified area, and how

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<sup>9</sup> Another area of inquiry may focus on differences in the access philosophy being advocated by the two petitioners. Some of the commenters perceive a fundamental difference between the access schemes proposed by Apple and WINForum, although the technical basis for their preference and the spectrum access compatibility of the two approaches is not presented in any technical detail. For example, there are comments directed against the access approach proposed in the WINForum petition. See e.g., Comments of M. Carling, David Caulkins and Mark Kohler, but other parties support the WINForum approach, see e.g., Comments of AT&T Corporation. Yet other parties cannot yet choose between the two proposals. See e.g., Comments of Information Technology Industry Council at 2 and Northern Telecom, Inc. at 6.

can such a limit be enforced as a practical matter if there is not single entity in control of these transmitters?

- (f) Is sharing feasible, and under what conditions, with existing or future services?
1. What is the impact of unlicensed operations on existing services in the bands proposed?
  2. What is the impact on the unlicensed operations from existing users of the bands proposed?

Constellation believes that it is essential for the Commission to obtain this technical information if it is to develop a meaningful set of rule proposals on which interested parties can provide substantive comment.

Respectfully submitted,



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June 25, 1995

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## CERTIFICATE OF SERVICE

I, Robert A. Mazer, do hereby certify that the foregoing "Reply Comments" of Constellation Communications, Inc. was served by hand\* or first-class mail, postage pre-paid, this 25th day of July, 1995 on the following persons:

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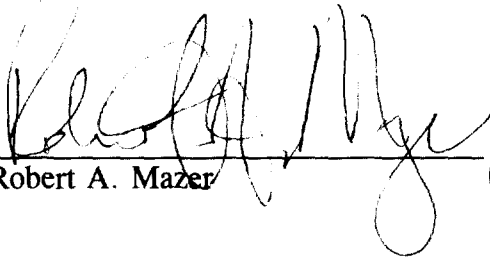
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